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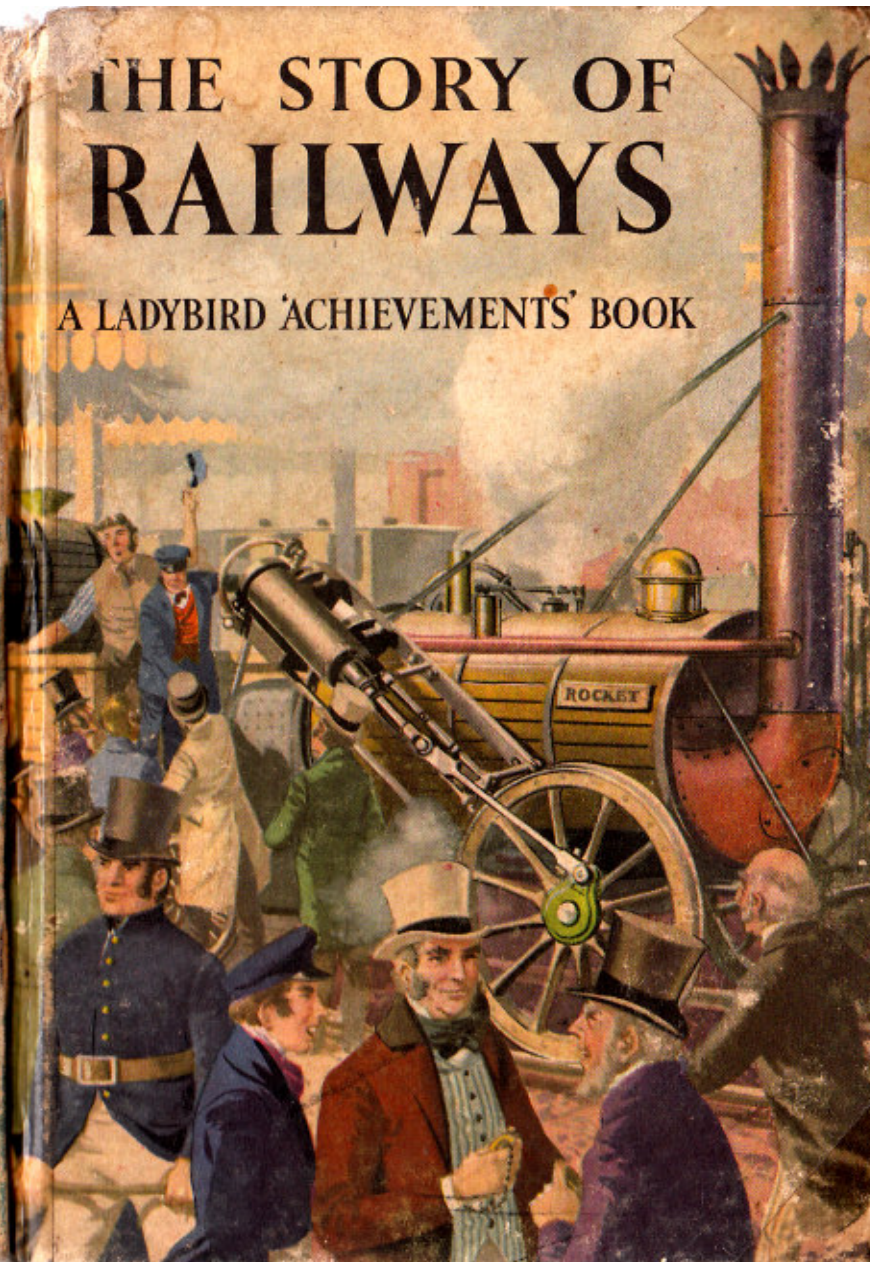
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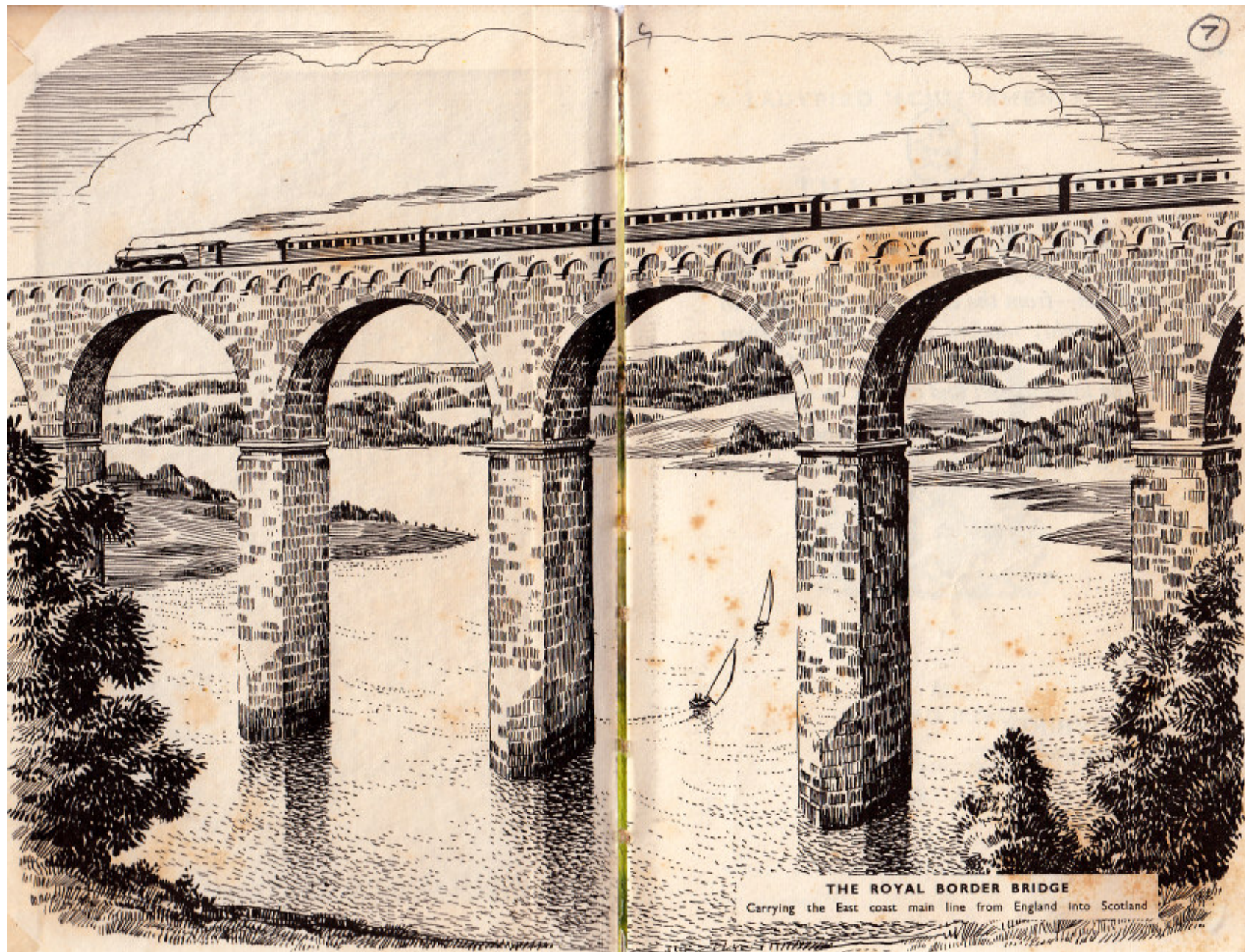
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THE STORY OF RAILWAYS

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A LADYBIRD 'ACHIEVEMENTS' BOOK

THE STORY OF RAILWAYS



by
RICHARD BOWOOD

with illustrations by
ROBERT AYTON

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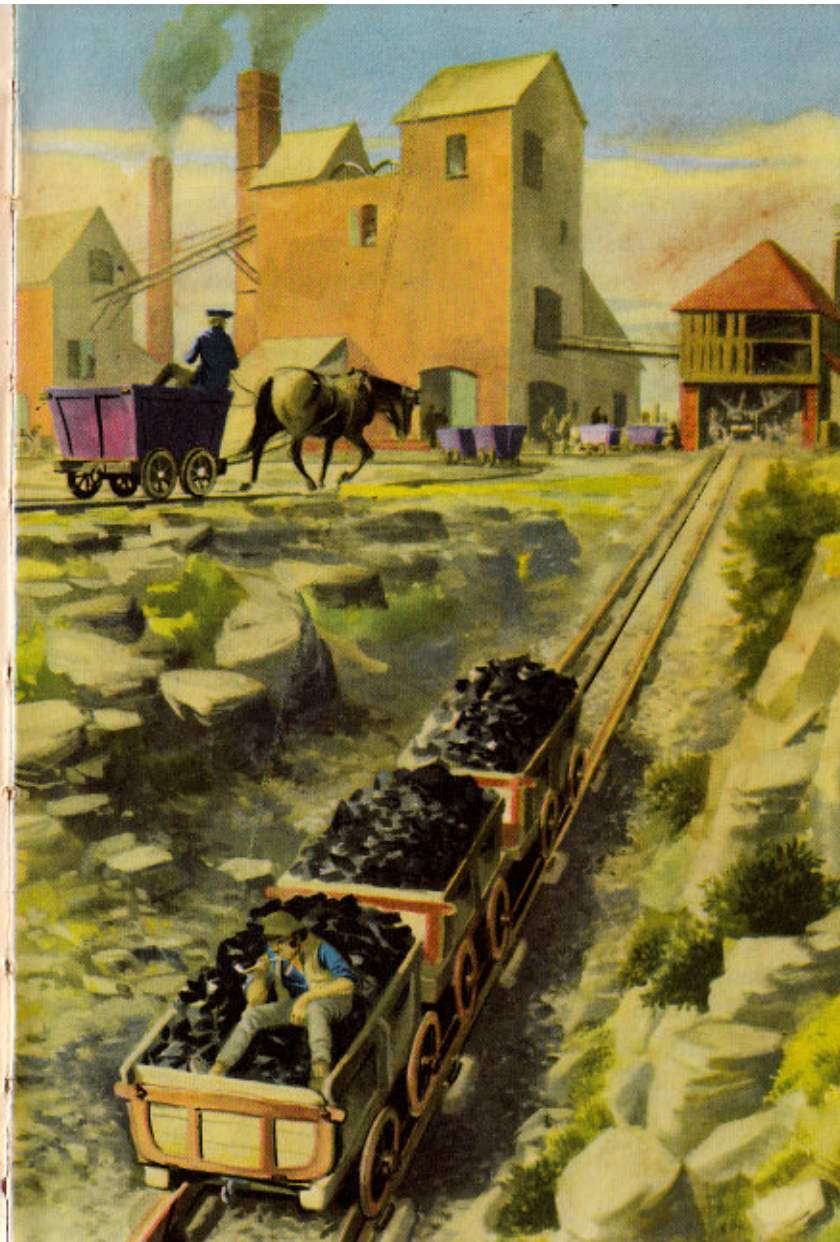
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The First Railways

The picture shows the first kind of railway, used at coal mines to haul coal from the pithead. This was before locomotives—steam engines which drive themselves—had been invented. The advantage of the railway was that when wheels could run on smooth plates, or on iron rails, they were much easier to haul. The trucks were pulled by horses, or sometimes by a rope connected to a stationary steam engine.

The scene shown in the picture would have been sometime between 1790 and 1820, when Great Britain led the world in transportation. John McAdam invented a new way of making roads so that they were hard enough not to be cut into deep ruts. Thomas Telford, the poet son of a shepherd, made fine roads and wonderful bridges. The Duke of Bridgewater and others constructed canals along which goods could be carried by barges.

It was essentially the age of the horse, and no one could foresee the day when the horse would no longer be the only form of tractive power. Horses pulled drays, wagons and carts, private carriages and mail coaches. They pulled the barges along the canals and they hauled the trucks on the mine railways. Horseback was the normal way of travelling. 'Horsepower' was then—*horse power*.

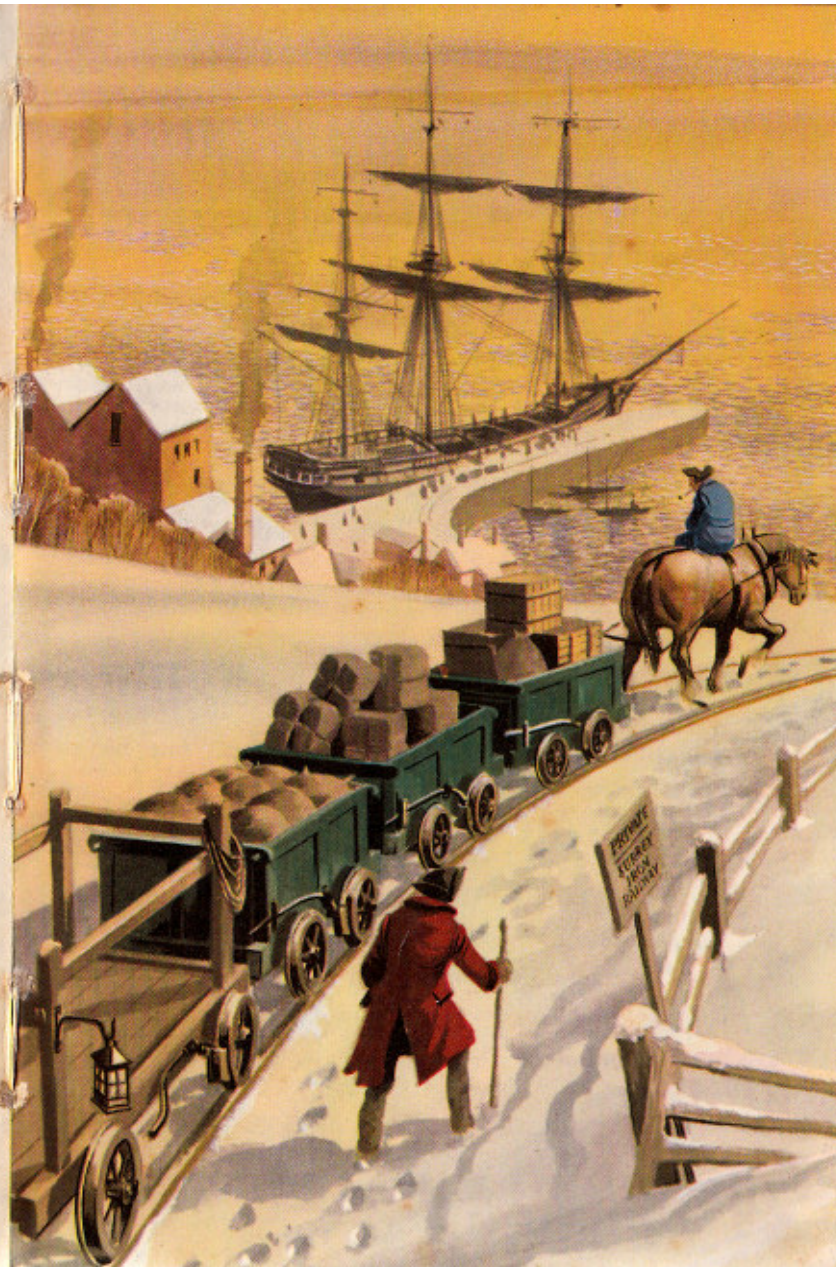


The Surrey Iron Railway

The first public railway in the world came into being as a result of Britain's war with the France of Napoleon. It was the custom to carry goods from ships at Portsmouth to London by coastal vessels, but there was always the danger that the French fleet might sail into the Channel. So a horse-tramway was begun to link London and Portsmouth.

The danger was removed in 1805 when Lord Nelson defeated the combined fleets of France and Spain at Trafalgar, and the new railway was not continued beyond Merstham, nineteen miles south of London. Nevertheless this was a public railway, with trucks drawn by horses. It was used mainly to carry coal, bricks, lime and sand, and it was never meant to carry passengers.

It was not a proper railway, of course; no passengers were carried and it did not run to a timetable. There were no stations. More horse-drawn railways were built in other parts of the country for carrying heavy goods. A flat truck was attached, on which the horse could ride when the train was running down a gradient. The Surrey Iron Railway was considered a wonderful idea at the time, and no one could have foreseen the day when railway lines would be laid throughout the land.



The First Steam Engine

Railways as we know them were born of the steam engine, and the name we honour as the first inventor is a Cornishman, Richard Trevithick.

Trevithick was a very strong man, and he was quick with figures. He also had a most inventive mind. He was the engineer of a tin mine near Penzance, and in 1797 when he set about improving the rather wheezy stationary engine, he had a great idea. Would it not be possible, he thought, to make a steam engine on wheels, which would use its own power to drive itself along? A kind of iron horse?

In 1804 he made his first steam engine, the first in the world. It ran on iron wheels on rails at the Pen-y-Darren mineral railroad in Wales. The next one he made was put to work at a Tyneside colliery.

But Trevithick was twenty years in advance of the times; no one really saw the possibilities in the strange and fearsome looking engines. He tried to prove their value by running a passenger train, hauled by a steam engine, round a small circular track on some waste ground in London. People paid for the ride, but saw it only as a fair-ground novelty.



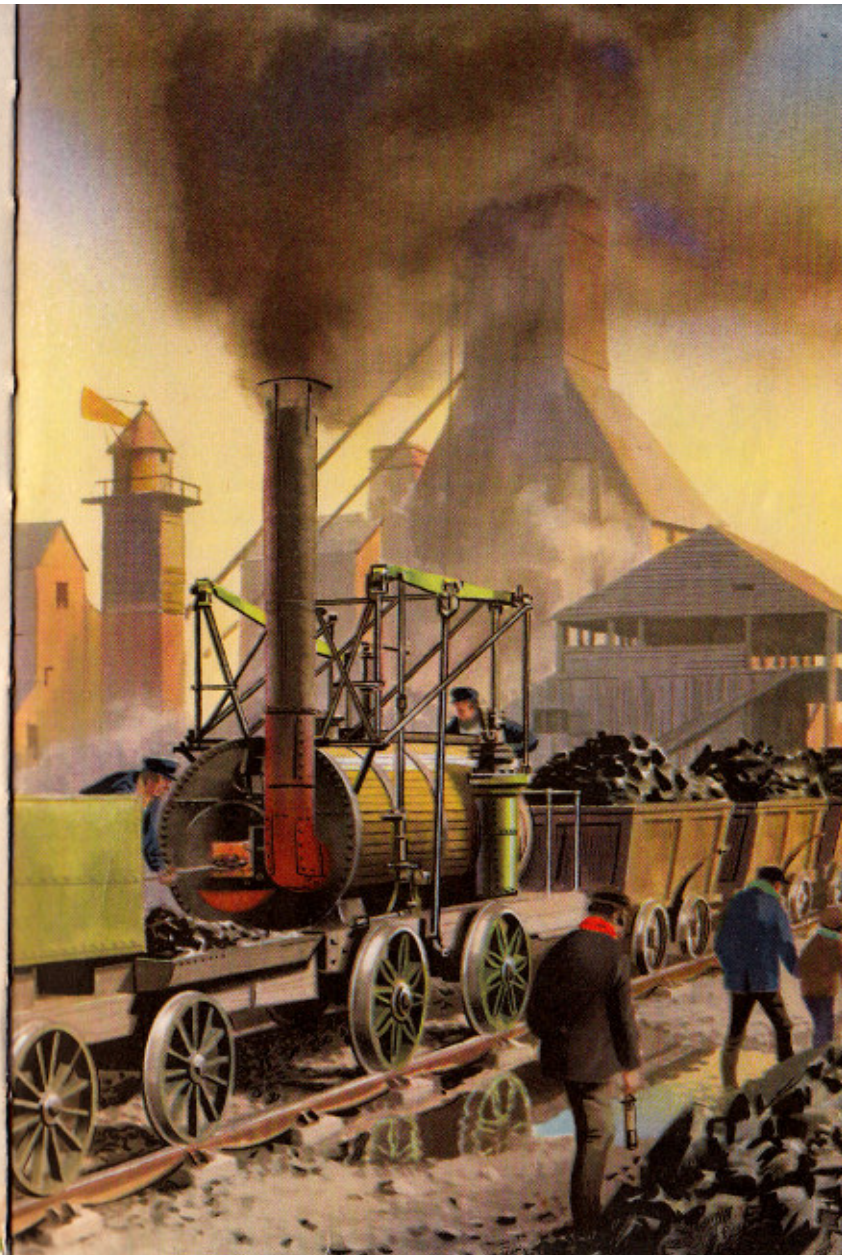
'Puffing Billy'

The scene of the next important event in our story is a four mile stretch of line at the Wylam Colliery, near Newcastle-upon-Tyne. It was one of the oldest horse-tramways in the country, where horses hauled wagons of coal from the pithead to the River Tyne. There the coal was loaded into barges which took it down the river to Newcastle, to be shipped to London.

It was on this short stretch of line that a very famous locomotive made its first run. It was built in 1813 by William Hedley, of the Wylam Colliery, with the help of the principal engineer and the foreman blacksmith. The engine was so noisy, and emitted so much smoke that it was called 'Puffing Billy.'

'Puffing Billy' started to work for the colliery in 1814. She was modified and improved, and for a time she was put on eight wheels instead of four. She was not fast, nor handsome, but she was so efficient that she hauled coal trucks for the colliery for nearly fifty years.

She retired in 1862 and was sent to the Patents' Museum in London, a forerunner of the Science Museum. You can still see 'Puffing Billy' in a well-deserved place of honour in the Science Museum.



George Stephenson

George Stephenson was born in 1781, the son of the stoker of a Colliery engine at Wylam, where 'Puffing Billy' was later to run. When he was fifteen George went to work, for a shilling a day, as his father's assistant. He learnt to read and write in his spare time, and studied everything to do with steam engines, which were his passion.

In those days a number of engineers were trying to design and build efficient steam locomotives, and none of them was more enthusiastic or painstaking than George Stephenson. He and his son Robert were destined to become the greatest names in the story of railways.

George Stephenson built his first engine in 1814, and a more successful one the next year. He was also an expert in railway construction. When a new public railway was constructed between Stockton and Darlington, George Stephenson was the surveyor and engineer. The railway was opened in 1825, and the first train was hauled by a new engine, built by George Stephenson, called 'Locomotion.'

'Locomotion' created a sensation, for it achieved a speed of twenty miles an hour. It also had the distinction of hauling the first train on the first *public* railway in the world with a steam locomotive.



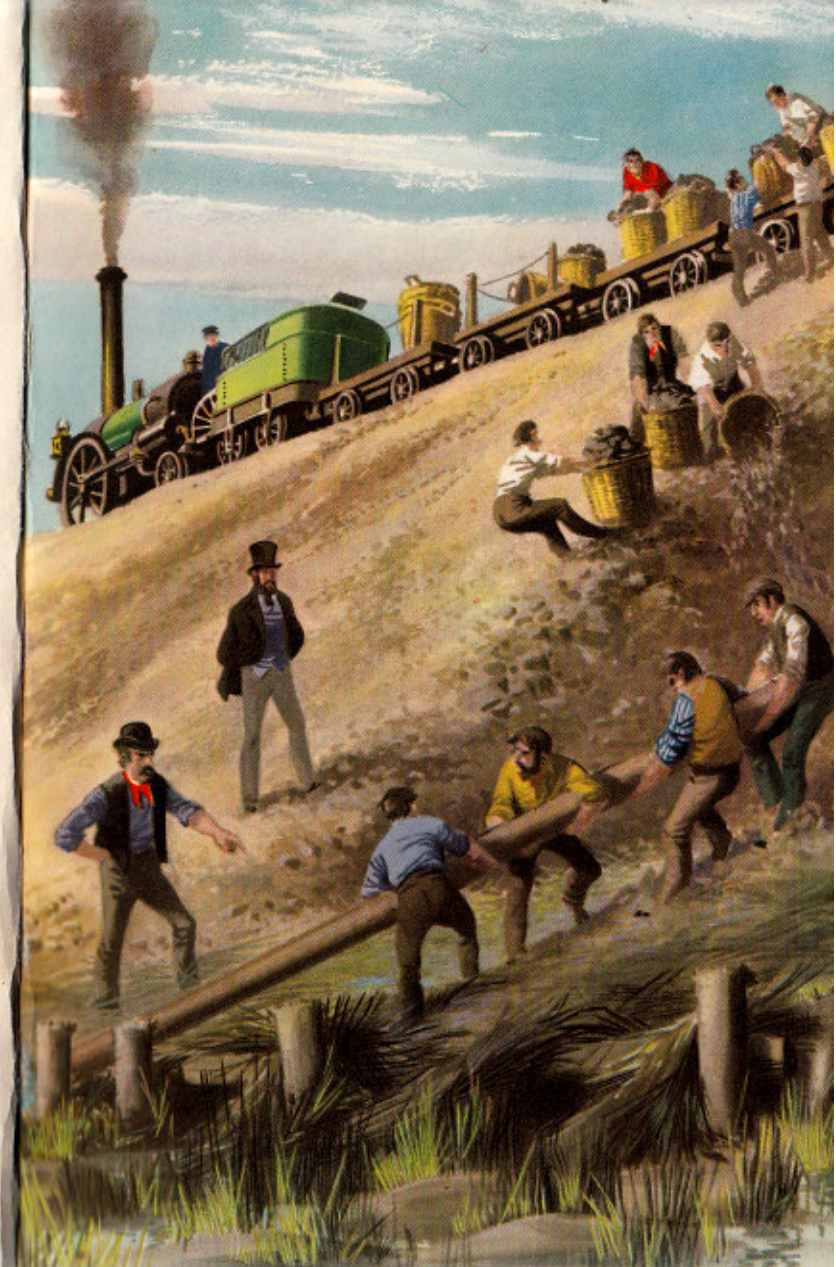
The Liverpool and Manchester Railway

The Stockton and Darlington Railway was originally intended for goods traffic only. The first complete railway for passenger and goods traffic, with trains running to a timetable, was the Liverpool and Manchester Railway which opened in 1830.

Bitter opposition had to be overcome in Parliament before the line could be built. Landowners objected to the line crossing and spoiling their land, farmers said their cows would go dry at the sight of a steam engine, and many people dreaded terrible accidents.

Permission was at last obtained and George Stephenson was appointed Chief Engineer of the new railway. The thirty-five miles of line was built between Liverpool and Manchester, and many engineering problems had to be solved.

The main difficulties were making the tunnels at the Liverpool end of the line, and building an embankment across the wide stretch of marshland known as Chat Moss. It seemed for a time that the embankment would never be built; everything they put in to provide foundations just sank into the marsh. But Stephenson had the patience which goes with genius. He persevered, and by 1830 the new line was completed.



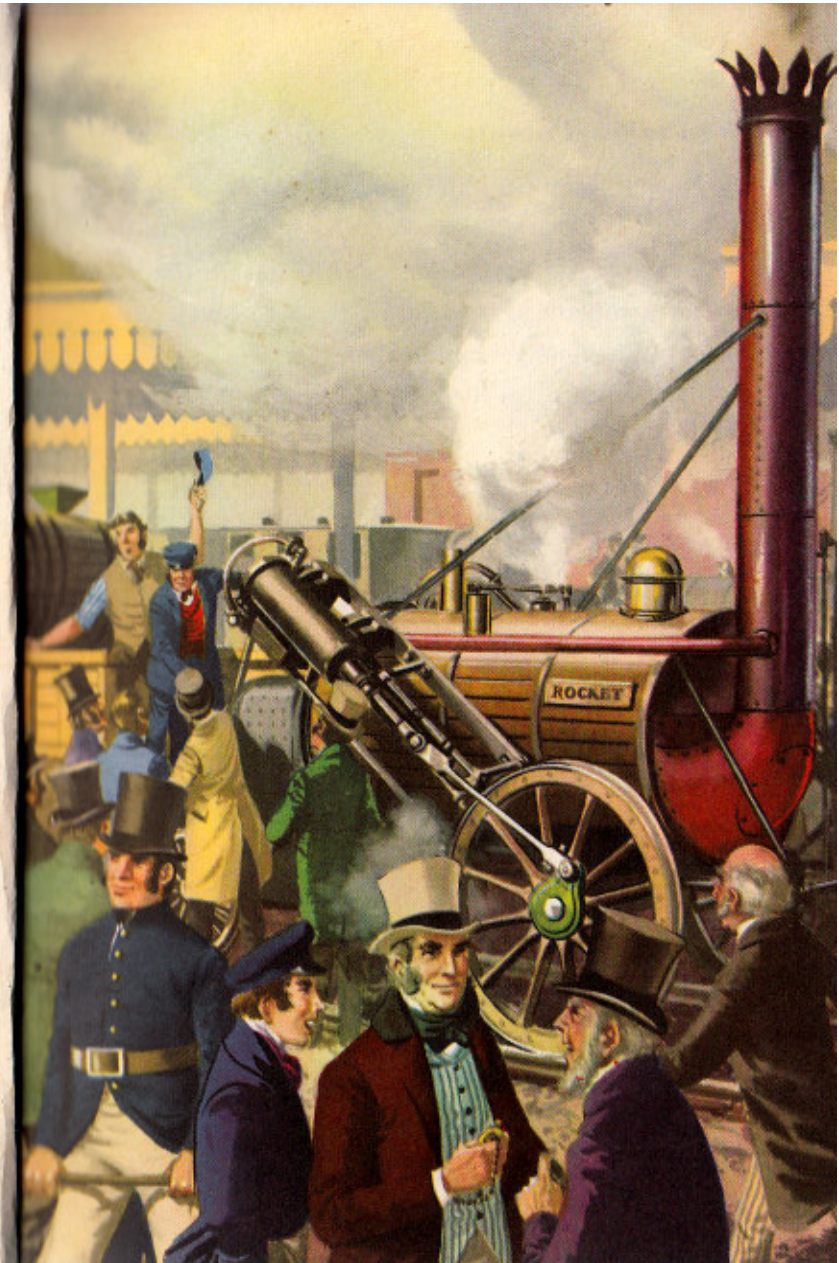
'The Rocket'

When the Liverpool and Manchester Railway was nearing completion, the Directors announced a competition with a prize of £500 for the most efficient railway engine. Tests were held at Rainhill, near Liverpool, and the engines were expected to be able to run at eight to ten miles an hour.

Five different engines were entered for the competition, but there was no doubt about the winner. It was 'The Rocket,' designed and driven by George Stephenson, and built by his son Robert. This famous engine passed every test in the competition and travelled at the unheard-of speed of twenty-nine miles per hour.

Thus it was that when the line was formally opened in 1830, George Stephenson, who had supervised the construction of the line, drove the first engine. This was 'The Northumbrian,' designed very like 'The Rocket' herself, which hauled the fourth train in a triumphal procession that marked the historic occasion. There was a large crowd, with the Duke of Wellington as the Guest of Honour.

With the opening of the first passenger railway in the world a new age, *The Railway Age*, had dawned.



'The Planet-Patentee'

Boys who watched 'The Rocket' puffing along at nearly thirty miles an hour would have gazed with the same awe and wonder as a modern boy has for a supersonic jet aeroplane in flight. 'The Rocket' was, however, more the final version of the experimental engines than the forerunner of the ones to come.

'The Rocket' had single driving wheels leading, a single carrying axle supporting the firebox, and inclined external cylinders at the rear. Within a few months of 'The Rocket's' appearance an even better locomotive was tested and proved, the engine which pointed the way to the engines of the future.

This was 'The Planet,' built by George Stephenson's son Robert and tested at the end of 1830. It was the first engine to combine horizontal cylinders encased under the smokebox in front, a cranked axle and a multitubular boiler. In its final version 'The Planet' had six wheels, arranged 2-2-2, for passenger locomotives.

'The Planet' was, in fact, an elementary form of the modern locomotive, and it proved itself by giving highly efficient service.



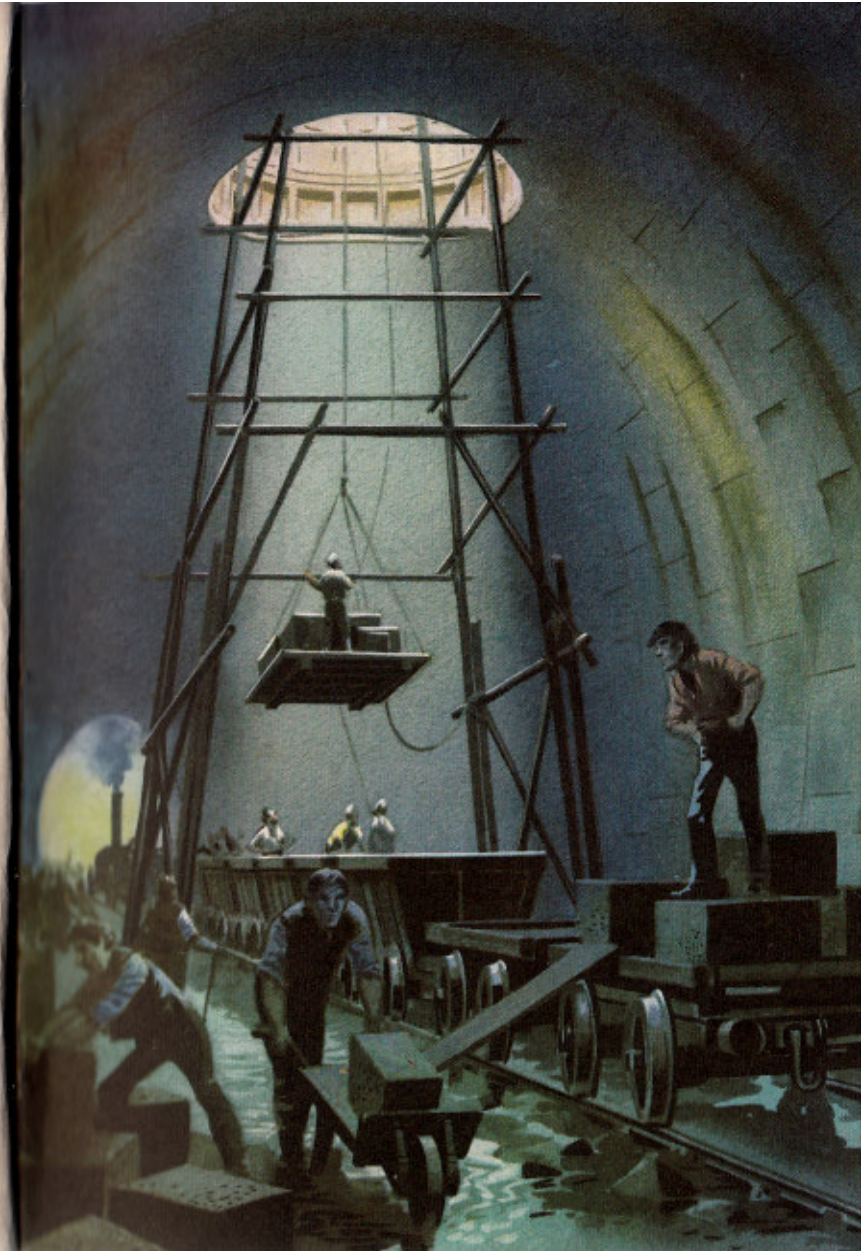
The Revolution Caused by the Railway

When the stationary steam engine became available to provide works and factories with the new source of power, a great change began in Britain's way of life. Where coal was easily obtained new factories sprang up, and around them new towns, usually of hideous little houses. Industry increased a hundredfold, and the 'industrial revolution' brought about a new England; there was abundant employment, ugliness, and great wealth.

The roads could not carry away the ever-increasing quantities of goods the factories produced, nor could the canals. The railway with the steam locomotive came just when it was urgently needed. Far-seeing men began to plan railways up and down the country, linking the cities and the ports.

The new railway system was to be like the arteries in a body, along which the products of industry could flow, from the factories to the markets, and to the ports. From the ports the goods could be shipped abroad, and from those exports would come the wealth to make Great Britain the richest country in the world.

So the surveyors, the civil engineers, and the labourers (the 'navvies' as they were called), were busy as beavers and the shining rails spread up and down, and across the land.



'Railway Fever'

Only eight years after the Liverpool and Manchester Railway was opened there were more than 1800 miles of railway line in operation in Britain, and a number of different companies. Think of the work the building of a railway line entails; the cuttings and embankments to avoid steep gradients, the tunnels and bridges, the stations and sidings, and the locomotives and rolling stock. It was all pioneer work and it could only have been done by a country which was in a fever—the 'Railway Fever.'

Enough skilled engineers had to be found; also the surveyors and labour. The number of trains in service was constantly increasing, and locomotives were improved, so that by 1848 the journey of 393 miles between London and Edinburgh, was made regularly in 13 hours.

Railway travel was not very comfortable in those days. The first-class passengers were well enough in sprung and padded coaches, but the second-class travelled in box-like affairs, and the third class sat on wooden benches in open trucks.

Britain had, with justice, been proud of her stage coach system, but the gaily painted and lovely coaches which had sped along the roads behind their fine horses were no longer required. They were sold cheap, and often became chicken houses.

